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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/763,582	02/22/2001	Eiji Okamoto	9319S-000178	9306
7590	05/06/2004		EXAMINER QI, ZHI QIANG	
Harness Dickey & Pierce PO Box 828 Bllomfield Hills, MI 48303			ART UNIT 2871	PAPER NUMBER

DATE MAILED: 05/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/763,582

Applicant(s)

OKAMOTO ET AL.

Examiner

Mike Qi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-15 and 24-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-15 and 24-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/16/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 26 recites the limitation "the metal film is composed of an elemental metal, such as aluminum or silver, or . . ." in claim 25. There is insufficient antecedent basis for this limitation in the claim. Because the claim 25 does not describe any metal film.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 08313890 (Hidenori et al) in view of JP 10-062604 (Hideo).

Claim 25, Hidenori discloses (abstract; Fig.9; paragraphs 0086 – 0090) that a substrate (TFT substrate 49) for a liquid crystal display wherein:

- the surface having a planar region (flat area 50) and a roughened region (roughened area 51), the roughened region comprising microscopic peaks and valleys;
- the heights of the tops of the peaks in the roughened region (51) are equal to or less than the plane of the planar region (50) (shows on the Fig.9);

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- a reflective board (52) (reflecting film) is formed on the roughened region (51).

Hidenori does not expressly disclose that a predetermined mark is formed in the planar region.

However, Hideo discloses (abstract; Figs.1, 4, 6; paragraphs 0030 – 0032; 0059 – 0061) that the photoresists (2') become alignment mark area, and which is formed on the planar region, and using alignment mark would easily perform alignment of the substrates, because the alignment mark is easy to read and to obtain accuracy alignment when bonding the substrates together.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange a predetermined mark formed on the planar region as claimed in claim 25 for obtaining easier read and accuracy alignment of the substrates when bonding the substrates together.

5. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hidenori and a Hideo as applied to claim 25 above, and further in view of US 5,220,444 (Mitsui et al).

Claim 26, lacking limitation is such that the material of the metal film composed of elemental metal such as aluminum or silver.

However, Mitsui discloses (col.1, line 40 – col.5, line 42; Figs.6, 8) that using silver (Ag) as the metal film formed on the flattened surface and the uneven surface of the substrate, such that the optical characteristics improved and the economy in production obtained.

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Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use metal film such as silver for improving the optical characteristics and the economy in production obtained.

6. Claims 1, 3 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 08313890 (Hidenori et al) in view of JP 10-062604 (Hideo), US 5,220,444 (Mitsui et al).

Claims 1, 3 and 24, Hidenori discloses (abstract; Fig.9; paragraphs 0086 – 0090) that a substrate (TFT substrate 49) for a liquid crystal display wherein:

- the surface having a planar region (flat area 50) and a roughened region (roughened area 51), the roughened region comprising microscopic peaks and valleys;
 - the heights of the tops of the peaks in the roughened region (51) are equal to or less than the plane of the planar region (50) (shows on the Fig.9);
 - a reflective board (52) (reflecting film) is formed on the roughened region (51);
- (concerning claim 24)
- because the substrate having roughened region, and the roughened region having micro peaks and valleys, so that must have a network-shaped for the roughened region; and forming such roughened region must use at least two compositions such as using photoresist and metal reflective layer to form such roughened region.

Hidenori does not expressly disclose that a predetermined mark (metal film) is formed on the planar region, and the reflecting film (same metal film) is formed on the roughened region, and the predetermined mark is an alignment mark.

However, Hideo discloses (abstract; Figs.1, 4, 6; paragraphs 0030 – 0032; 0059 –0061) that the photoresists (2') become alignment mark area, and which is formed on the planar region, and using alignment mark would easily perform alignment of the substrates, because the alignment mark is easy to read and to obtain accuracy alignment when bonding the substrates together.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange alignment mark formed on the planar region for obtaining easier read and accuracy alignment of the substrates when bounding the substrates together.

Still lacking limitation is such that the predetermined mark made of metal film and the reflecting film made of the same metal film.

However, Mitsui discloses (col.1, line 40 – col.5, line 42; Figs.6, 8) that the substrate (11) having planar region and roughened region, and it is essential to control the surface roughness of the reflection plate in order to display a bright image, so that the flattened surface is covered with a metal layer such as an Ag (silver) layer, and forming a metal thin layer on the uneven surface, such that the optical characteristics improved and the economy in production obtained.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the predetermined mark made of a metal film formed on

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the planar region and a reflecting film made of the same metal film formed on the roughened region for improving the optical characteristic and obtaining the economy in production.

Accordingly, the claims 1, 3 and 24 would have been obvious.

7. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hidenori, Hideo and Mitsui as applied to claims 1, 3 and 24 above, and further in view of US 6,315,801 (Miyazaki et al).

Claim 4, lacking limitation is such that the predetermined mark is a process control mark.

However, Miyazaki discloses (col.2, line 58 – col.3, line 15) that during mass production having several process (the process can be used in production of electrode plate or production of a liquid crystal display device), and in order to effectively perform these processes with high accuracy, it is available to apply process control marks, position alignment marks and apply various identification marks such as manufacture lot numbers, bar codes and the like for easy identification and manufacture control.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange a process control mark as claimed in claim 4 for achieving effectively perform the production process with a high accuracy.

Claim 5, Hidenori discloses (Fig.9; paragraph 0089) that the wiring is formed on the flat area (50), i.e., a planar region.

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8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hidenori, Hideo and Mitsui as applied to claims 1, 3 and 24 above, and further in view of US 5,973,763 (Fujimura et al).

Claim 6, lacking limitation is such that a sealant is formed in the planar region.

However, Fujimura discloses (col.1, lines 13- 30) that, generally, the first substrate and the second substrate are bounded though a seal material, and then the two substrates are adhered together by a certain pressure. Therefore, if the sealant is formed in a roughened region, the two substrates would be insufficiently sealed; and the sealant is formed in a planar region, the two substrates would be able to obtain a hermetical seal by a certain pressure. It is common and known in the art to form a sealant in a planar region as sealing the two substrates in a planar region would be easier to obtain a sufficient adhesion.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange a sealant in the planar region as claimed in claim 6 for achieving a hermetical seal.

9. Claims 7-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hidenori, Hideo and Mitsui as applied to claims 1, 3 and 24 above, and further in view of US 6,130,736 (Sasaki et al).

Claims 7-13, lacking limitation is such that the maximum height R_y , the arithmetic mean roughness R_a , the ten-point average roughness R_z , and the mean wavelength S_m in the roughness region are in predetermined ranges, and the ranges are set as claimed.

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However, Sasaki discloses (col.2, line 50 – col.7, line 59; col.8, line 33 – col.9, line 50; Fig.1) that the reflector member (15) having a surface roughness of 1 μm or less and a width of the concave portion is 45 μm or less. Therefore, the roughened region must have a certain range to represent the roughness. Sasaki discloses (col.6, lines 39-65) that in accordance with the reflector having such corrugated surface, the reflecting efficiency is improved and a bright display screen is attained, and the reflecting direction can be set in a wider range. A certain roughness (such as the arithmetic mean roughness R_a) would determine the maximum height of roughness R_y , the ten-point average roughness R_z , and the mean wavelength (the pitch of the roughness peak) S_m . Sasaki discloses (col.9, lines 33-50) that it is more preferable to set the surface roughness of the reflector at 1 μm or less, i.e., the arithmetic mean roughness R_a is set at 1 μm or less.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to develop a proper roughness value as claimed in claims 7-13 in order to obtain a proper reflection and scattering so as to improve the display quality.

Claims 14-15, the limitations are only given weight as intended use. Because any liquid crystal display device would comprise two substrates and a liquid crystal layer interposed between the two substrates; and any display can be used for any electronic apparatus, and that would have been at least obvious.

Response to Arguments

10. Applicant's arguments filed on April 16, 2004 have been fully considered but they are not persuasive.

Applicant's arguments are as follows:

1) The references do not teach a predetermined mark made of a metal film being formed on the planar region and a reflecting film made of the same metal film formed in the roughened region for the amended claim 1.

Examiner's responses to Applicant's arguments are as follows:

1) The reference such as Mitsui discloses (col.1, line 40 – col.5, line 42; Figs.6, 8) that the substrate (11) having planar region and roughened region, and it is essential to control the surface roughness of the reflection plate in order to display a bright image, so that the flattened surface is covered with a metal layer such as an Ag (silver) layer, and forming a metal thin layer on the uneven surface, such that the optical characteristics improved and the economy in production obtained.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299. The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi
April 29, 2004


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